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Exploring Pre-Service Science Teachers Physics Pedagogical Orientations towards Their Own Classroom Teaching

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Most of the South African universities attract their pre-service teachers' cohort from previously disadvantaged schools, either from the township or rural areas. This cohort of pre-service teachers lacks knowledge of science content due to their previous school conditions of limited resources such as science laboratories, availability of science teachers, large numbers of under-qualified physical science teachers and overcrowded classes. Again, teachers limited Pedagogical Content Knowledge in the subject they are teaching plays a role in learner's lack of science knowledge. At university, these pre-service teachers are expected to transform their teaching styles to accommodate inquiry-based learning and other teaching approaches that are often learner-centered. This can be done by either exposing them to reading materials, observing each other teaching during micro-teaching, watching recorded videos or creating lesson plans for assessment purposes while they are not being exposed on different ways of teaching science topics for different contexts and including the elements of inquiry-based. A key dimension in science education is being investigated which is referred to as teacher's pedagogical orientations. Orientations are teachers' knowledge and beliefs about the purposes and goals of teaching science at a specific grade level.

The aim of this study was to explore pre-service science teacher's physics pedagogical orientations towards their own classroom teaching and identify factors that influence their orientations. There are various classifications of pedagogical orientations in literature, however, based on research by Ramnarain and Schuster (2014) in South Africa orientations were divided as follows; direct approaches into (direct didactic and direct interactive) and inquiry approach into (guided inquiry and open inquiry). The pedagogy preferences of pre-service science teachers were measured using an instrument comprised of three items that portrayed an actual teaching scenario for physics concepts. The items had four alternative teaching methods; participants were expected to select the most appropriate and the most inappropriate options and space was provided for them to justify their preferences. Therefore, a mixed method approach was employed, where a questionnaire was administered to all 2018 Bachelor of Education 4th year physical science students which they were 35 in total at a South African university. In the final year of study, students take a year module on the methodology of physical sciences teaching. One of the core themes is to enable students to understand the nature and significance of physical sciences and then develop competencies necessary for successful and effective teaching in physical sciences.

The results revealed that pre-service teacher's preferences from the three items portrayed an actual teaching scenario for physics concepts were an inquiry approach, which is aligned with the guided inquiry and open discovery. A small number of participants preferred teacher-centered teaching approach; direct didactic. Apart from teacher's knowledge, factors such as the availability of resources, class sizes were found to influence their pedagogies. This invokes the need to establish to what extent the preferred pedagogical orientation of pre-service teachers aligns with an inquiry-based pedagogy.

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Yes

Level for award
 (Hons, MSc,
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PHD

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